

Without asserting the identity of these two forms, it becomes necessary to point out the very close relation existing between them; and it may be that they are only the old and young conditions of one species. The concentric ridges on the body-whorl of *E. sculptus* become wider apart as the suture is approached, when they often assume very much the appearance given in the figures of *E. funatus* referred to. The apparent similarity between these shells should be indicated, in case any difference may be detected in their opercula. That of *E. funatus* has not been described, so far as I know.

EXPLANATION OF PLATE II.

- Fig. 1.* A small circular operculum (?) produced into a blunted denticulation. Law Quarry.
Fig. 2. A small oval operculum, with a central globular nucleus. Law Quarry.
Fig. 3. An elongated pinna-shaped body, probably an operculum. Law Quarry.
Fig. 4. A thin, somewhat auriform body of the same nature. Inverteil Quarry, near Kirkcaldy, Fife.
Fig. 5. A small, thin, round operculum. Law Quarry.
Figs. 6 & 7. Two small shells, probably species of *Naticopsis*, with the opercula *in situ*. Law Quarry.
Fig. 8. *Naticopsis Phillipsii*, M'Coy, with the operculum in place, but partially abraded on one side. Collection, British Museum.
Fig. 9. A supposed operculum, conical and with imbricating ridges. Upper Silurian, island of Gothland. Collection, British Museum. $\times 2$.
Figs. 10 & 11. *Euomphalus sculptus*, Sow., with the operculum in place. Wenlock Limestone. Collection, British Museum.
Fig. 12. Another specimen, but with the outer side of the operculum somewhat conical. Collection, British Museum.
Fig. 13. The operculum of *E. sculptus* free. Collection, British Museum.
Fig. 14. *Euomphalus sculptus*? with a shining scarcely spiral operculum. Collection, British Museum.

(N.B. The originals of figs. 1-7 are in the cabinet of Mr. James Beunie.)

V.—*Descriptions of new Species of Lepidoptera in the Collection of the British Museum.* By ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

[Plate IV.]

THE species described in the present paper are chiefly from India and China, all, with one exception, being Asiatic, and the latter being the first African species in a hitherto purely Asiatic genus.

Nymphalidæ.

1. *Argynnis gemmata*, sp. n. (Pl. IV. fig. 1.)

Fulvous, with the body and basal third of the wings shining coppery brown: wings with three transverse series of black spots, the first biangulated, in zigzag fashion, on the primaries, and simply angulated on the secondaries; this series is placed just beyond the middle of the wings; the second and third series united at their costal extremities near the apex; a nearly marginal interrupted black line: primaries with thick black discoidal markings, much as in *A. cashmirensis*; a subcostal, ill-defined, blackish, triangular spot between the first and second series. Primaries below paler than above, with smaller black spots, the basal area not brown, as above, but uniform with the rest of the ground-colour, the costa ochreous towards apex, and the outer margin and fringe spotted with the same colour; an oblique apical chestnut-red stripe, margined internally by a conspicuous spot and a minute dot of silver, and bounded externally by an abbreviated submarginal series of six oval silver spots, which decrease in size at both extremities of the series; the first two visible spots of the second series of the upper surface greyish green: secondaries somewhat like those of *A. myrina* (but altogether brighter and prettier, with the central silver spot more as in *A. lathonia*), bright ferruginous varied with patches of ochreous, the basal half occupied by about fifteen silver spots and streaks of various sizes and shapes, the two central ones united and passing through a postmedian arched series of sagittate silver spots; a marginal series of large triangular spots, abdominal margin, and the base of the costal margin silver; all these markings are slenderly edged with black; a discal series of dull green rounded spots with silver pupils; fringe bright ochreous spotted with ferruginous: body below ochraceous. Expanse of wings 1 inch 11 lines.

Darjiling (*Lidderdale*); between Nepal and Tibet (*Charlton*).

The two examples taken by Major Charlton have been in the Museum collection since 1852; but, probably owing to the fact that they belong to a difficult genus, nobody appears to have ventured to describe them. I find them labelled "Tibet;" but our register says "between Nepal and Tibet," and the fact that Dr. Lidderdale labels his specimen as taken at "Darjiling" renders it extremely likely that Major Charlton's were also taken on the Nepal side of the Himalayas.

The position of this species seems to be next to *A. myrina*.

Papilionidæ.

2. *Papilio nebulosus*, sp. n. (Pl. IV. fig. 3.)

In some respects nearest to *P. antiphates*, in others to *P. euphrates*, but the primaries dull greyish black, crossed at the base by two broad pale belts; the costal half of the wing also crossed by four abbreviated white bands, united below the median vein so as to form two large U-shaped markings, and crossed by black veins; submarginal tapering band as in *P. euphrates*, white; a large roundish diffused patch of white on the internal area near the exterior angle: secondaries as in *P. antiphates*, excepting that they appear greyish through their showing the markings of the under surface, and that the submarginal lituræ are continued upwards above the third median branch. Wings below blackish; the base and the interno-median area of the secondaries sordid white or brown, shading into white; subbasal band of primaries scarcely traceable; other markings as above, but sordid: secondaries with the abdominal margin and fringe white, bounded internally by a black stripe along the submedian vein; a central elbowed series of six sordid-white elongated spots, bounded on both sides by ill-defined black spots, the third or central spot pyriform and enclosing a smaller black spot; a discal angulated series of six more or less pentagonal ochreous patches, their two outer sides slightly sinuated and black-edged; a submarginal series of five almost confluent, oblong, sordid-white patches placed corner to corner; outer margin and tail black: body below white, spotted at the sides with black; anus pale flesh-coloured. Expanse of wings 3 inches 3 lines.

Darjiling (*Lidderdale*).

But for the fact that this species is, in some of its most important characters, nearer to *P. euphrates* of the Philippines, I should have thought it possible that it might be an extraordinary melanistic variety of *P. antiphates*.

3. *Papilio Mariesii*, sp. n. (Pl. IV. fig. 4.)

Allied to *P. alebion*, from which it differs in the absence of the submarginal black band on the primaries, the narrower discal belt of secondaries, which is greyish externally and becomes obsolete towards the costa, the slightly larger white spots above the blue-centred marginal black spots of the secondaries, and the slightly larger and deeper-coloured orange subanal patch: on the under surface the primaries differ as above, the outer discal line of the secondaries is obsolete, and

the marginal black stripe encloses a much smaller spot of the ground-colour at apex. Expanse of wings 2 inches 10 lines.

Lu-Shan mountains, province of Kiukiang, China.

One specimen of this species was taken by Mr. Charles Maries.

4. *Thecla betuloides* (Blanchard in litt.). (Pl. IV. fig. 2.)

Above chocolate-brown, shot with purple, excepting on the outer border: primaries with a large patch of bright orange on the disk immediately beyond the cell: secondaries with an orange patch at the anal angle. Under surface grey; the cells closed by a short brownish fasciole with darker marginal lines edged externally with white; an oblique discal band and a second band nearer and parallel to the outer margin of the same colours; a submarginal dusky stripe, followed in the secondaries by a white marginal line; base of fringe occupied by a black line: secondaries with an orange anal patch enclosing a black dot on the first median interspace; a subanal W-shaped blackish line joining the inferior extremity of the inner discal band, its inner edge bordered with orange and its outer edge with white; anal lobe and tail black; pectus white, venter testaceous. Expanse of wings 1 inch 4-6 lines.

Three specimens. Kiukiang, China (Maries).

Although quoted in the Supplement to Mr. Kirby's 'Catalogue,' this species cannot be regarded as described by Blanchard; that author simply remarks, "In the neighbourhood of Pekin an allied species exists which is distinguished by several characters;" and in a footnote he says "This species (*Thecla betuloides*, Lucas) has the wings tinted with blue above and grey below." From the vague resemblance which the species bears to *T. betulæ*, and from the fact that the underside is grey and the upperside shot with purple (not blue), I have little doubt that the species here described is that mentioned by Blanchard; and therefore I have adopted for it the name which he has proposed; but nobody can be certain of any thing from his casual hints as to the insect.

5. *Thecla tyrianthina*, sp. n. (Pl. IV. fig. 5.)

Above brown, shot with purplish blue in the male and with purple in the female. Under surface of wings pale greyish brown, darker towards the base; a brown fasciole, traversed by a pale line, at the end of the cell; a broad, slightly tapering discal brown belt from the costal margin of each wing; a submarginal brown stripe and a marginal brown border: secondaries with an orange patch enclosing a square of four

black spots, bounded above by an incomplete W-shaped black line, and below by an alternately white and black fringe; a black-edged whitish oblique band near the anal angle across the abdominal border, bounded internally by a brown band, and externally by an orange marginal border; anal lobe and tail black tipped with white: pectus greyish, palpi white below, venter testaceous. Expanse of wings 1 inch 3-4 lines.

Kiukiang, China (*Maries*).

Allied to *T. arata*.

6. *Thecla stygiana*, sp. n. (Pl. IV. fig. 6.)

Above smoky brown, without markings. Wings below greyish brown, with an indistinct externo-discal series of blackish spots bounded outwardly with yellowish: primaries with an indistinctly whitish-bordered black spot at external angle: secondaries with a very indistinct submarginal series of dusky spots; a patch of orange at external angle enclosing a black spot above the tail, which is also black; anal angle black: pectus bluish white; venter sulphur-yellow. Expanse of wings 1 inch 7 lines.

Nikko, Central Japan (*Maries*).

7. *Milleria pontioides*, sp. n.

Creamy white: primaries with the veins brown; external two fifths brown, enclosing a small white spot at the inferior angle of the cell, and crossed by a disco-submarginal series of abbreviated whitish dashes upon the veins: secondaries with the outer half greyish; a broad external brown border from costa to first median branch, interrupted by five longitudinal whitish dashes on the veins: antennæ black. Primaries below nearly as above, but the external area blackish, and the spots upon it white: secondaries sulphur-yellow, excepting towards the costa, the outer half black-brown, with the end of the cell and five streaks on the veins white. Expanse of wings 1 inch 9 lines.

Sarawak (*Low*).

Somewhat like *Pontia pactolica*, Butl., in pattern and coloration.

Lithosiidæ.

8. *Camptoloma binotatum*, sp. n.

Nearly allied to *C. interioratum* (*C. erythropygum*, Felder, Nov. tab. xciii. fig. 7) from China and Japan, but with the primaries ochreous, nearly as dark as the secondaries; the

oblique lines from near the base of the costal margin not united to one another, consequent upon the abbreviation of the inferior or basal one; the upper line, on the contrary, continued (by means of a terminal elbow) through the red streaks, and uniting with the oblique line immediately beyond the cell; the fourth or subapical discal line longer, slightly waved or bisinuated instead of regularly concave; the submarginal line longer and much more slender; only two instead of three large black spots on the fringe at external angle. Body bright ochreous, the thorax scarcely perceptibly paler than the abdomen; anus lake-red. Expanse of wings 1 inch 7 lines.

Two specimens. Shillong (Assam).

I have examined a fair series of the Japanese species, and therefore am in a position to state positively that it is not a variable insect.

Liparidæ.

TRISULOIDES, gen. nov.

Trisulæ affine genus; differt alis anticis minus productis; posticis magis rotundatis; capite retracto, brevioribus; palpis brevioribus; signaturis supra generis *Chrysorithri* vel *Catocalæ*.

9. *Trisuloides sericea*, sp. n.

Smoky brown; sericeous, especially the primaries; these wings above transversely irregularly banded with sandy brown, the bands being bordered and intersected by blackish lines; a more or less defined, nearly semicircular, pale patch from the costa to the first median branch and slightly impinging upon the discoidal cell; outer border sandy brown, very irregular along its inner margin, which is edged with black; its outer margin is pale, limited by a submarginal series of dusky spots; a double black spot, bordered internally with snow-white, just touching the external border near the external angle; fringe whitish brown, spotted with blackish: secondaries pale towards the costa; a large central ochreous patch; a squamose marginal streak near the anal angle; fringe white or whitish varied with quadrate black spots: head, front of thorax, and posterior margins of the abdominal segments greyish; abdomen with four dorsal tufts. Wings below sericeous, pale, the outer borders dull silvery white; veins blackish; a nearly central, angulated, dusky band, followed by a testaceous band bounded externally by an angular dusky line, immediately beyond which is a curved externally

dentated dusky stripe; marginal line blackish; fringe white, spotted with black: primaries with ochreous basal area: body below blackish, pectus more or less clothed with greyish hairs; tarsi more or less distinctly banded with grey. Expanse of wings 2 inches 6 lines.

Shillong, Assam, and Darjiling.

On the upper surface this species much resembles *Chrysorithrum*, *Allotria*, and *Catocala*, the primaries especially reminding one of Walker's "*Catocala*" *albifascia*, a species apparently referable to the genus *Zalissa*; in structure and the pattern of the under surface it agrees far better with *Trisula*.

Acontiidæ.

10. *Apsarasa liturata*, sp. n.

Primaries above sulphur-yellow, costal margin white; all the borders crossed by black-edged metallic blue-green lituræ as follows—two near the base of the costal border, two at basal fourth, one running obliquely from just before the middle of the costa to the end of the cell, where it unites with an irregularly ∞ -shaped line of the same colour interrupted by a shining rose-red discoidal dash, three curved lines on the costal border beyond the cell, the first very short, a dot followed by a zigzag line just before apex, and an oblique V-shaped marking at apex; markings of the outer border becoming brown upon the fringe, the first and third being short dashes, the second formed of two dashes united by a \leftarrow -shaped marking, the fourth and fifth long dashes, nearly united internally by a metallic green lunule; on the internal border two \leftarrow -shaped markings before the middle, an oblique line beyond the middle, and three reversed oblique lines close to external angle; at the base of the median area is a large **3**-shaped marking, partly metallic green and partly rose-red, and on the second median interspace two rose-red transverse spots, dotted at each end with metallic blue-black: secondaries semitransparent sericeous white, with sulphur-yellow borders and veins: head, collar, front of thorax and of tegulæ sulphur-yellow, transversely striped and spotted with bluish and purplish black, remainder of body white. Under surface cream-colour, sericeous. Expanse of wings 1 inch 7 lines.

♂, Camaroons; ♀, Old Calabar.

Evidently congeneric with *A. radiata* and *A. figurata*, but more beautiful in colouring.